

- a. Write a numerical expression for the volume of each of the rectangular prisms above. a)  $(15 \text{ in})(1\frac{1}{2} \text{ in})(3 \text{ in})$  b)  $(15 \text{ in})(1\frac{1}{2} \text{ in})(6 \text{ in})$
- b. What do all of these expressions have in common? What do they represent? The area of the base! c)  $(15 \text{ in})(1\frac{1}{2} \text{ in})(9 \text{ in})$
- c. Rewrite the numerical expressions to show what they have in common.  $(\frac{15}{1} \text{ in})(\frac{3}{2} \text{ in}) = (22\frac{1}{2} \text{ in}^2)$
- d. If we know volume for a rectangular prism as length times width times height, what is another formula for volume that we could use based on these examples? (Area of base)(height)
- e. What is the area of the base for all of the rectangular prisms?
- f. Determine the volume of each rectangular prism using either method.

$$\begin{matrix} L & W & & L \cdot W \cdot h \\ \left(\frac{15 \text{ in}}{1}\right) & \left(\frac{3}{2} \text{ in}\right) & = & \frac{45}{2} \text{ in}^2 = \left(22\frac{1}{2} \text{ in}\right) \end{matrix}$$

$$\textcircled{1} \quad \left(\frac{45}{2} \text{ in}^2\right) \left(\frac{3}{1} \text{ in}\right) = \frac{135}{2} \text{ in}^3 = 67\frac{1}{2} \text{ in}^3 \quad \begin{matrix} 90 \\ 180 \\ 270 \\ 360 \end{matrix}$$

$$(15 \text{ in})(1\frac{1}{2} \text{ in})(3) = \frac{135}{2} \text{ in}^3 = 67\frac{1}{2} \text{ in}^3$$

$$\textcircled{2} \quad \left(\frac{45}{2} \text{ in}^2\right) \left(\frac{6}{1} \text{ in}\right) = \frac{270}{2} \text{ in}^3 = 135 \text{ in}^3 \quad \begin{matrix} 4 \\ \therefore 45 \\ 9 \\ 405 \end{matrix}$$

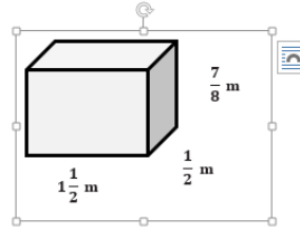
$$\textcircled{3} \quad \left(\frac{45}{2} \text{ in}^2\right) \left(\frac{9}{1} \text{ in}\right) = \frac{405}{2} \text{ in}^3 = 202\frac{1}{2} \text{ in}^3$$

**Example 2**

The base of a rectangular prism has an area of  $3\frac{1}{4}$  in<sup>2</sup>. The height of the prism is  $2\frac{1}{2}$  in. Determine the volume of the rectangular prism.

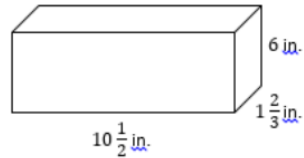
$$\begin{aligned} V &= \text{Area of the base} \cdot \text{height} \\ &= \left(3\frac{1}{4} \text{ in}^2\right) \left(2\frac{1}{2} \text{ in}\right) \\ &= \left(\frac{13}{4} \text{ in}^2\right) \left(\frac{5}{2} \text{ in}\right) \\ &= \left(\frac{13 \cdot 5}{4 \cdot 2}\right) \text{ in}^3 \\ &= \frac{65}{8} \text{ in}^3 \end{aligned}$$

1. Determine the volume of the rectangular prism.



2. The area of the base of a rectangular prism is  $4\frac{3}{4}$  ft<sup>2</sup> and the height is  $2\frac{1}{3}$  ft. Determine the volume of the rectangular prism.
3. The length of a rectangular prism is  $3\frac{1}{2}$  times as long as the width. The height is  $\frac{1}{4}$  of the width. The width is 3 cm. Determine the volume.

4.



- a. Write numerical expressions in two different ways, and explain what each reveals.
- b. Determine the volume of the rectangular prism.
5. An aquarium in the shape of a rectangular prism has the following dimensions: length = 50 cm, width =  $25\frac{1}{2}$  cm, height =  $30\frac{1}{2}$  cm.
- a. Write numerical expressions in two different ways, and explain what each reveals.
- b. Determine the volume of the rectangular prism.

Marcus reads for 30 minutes each night. He wants to determine the total number of minutes he will read over the course of a month. He wrote the equation  $t = 30d$  to represent the total amount of time that he has spent reading, where  $t$  represents the total number of minutes read and  $d$  represents the number of days that he read during the month. Determine which variable is independent and which is dependent. Then, create a table to show how many minutes he has read in the first seven days.

Number of Days ( $d$ )	Total Minutes Read ( $30d$ )
1	30
2	60
3	90
4	120
5	150
6	180
7	210

Independent variable

time

Dependent variable

Total minutes Read

## Example 2

Kira designs websites. She can create three different websites each week. Kira wants to create an equation that will give her the total number of websites she can design given the number of weeks she works. Determine the independent and dependent variables. Create a table to show the number of websites she can design over the first 5 weeks. Finally, write an equation to represent the number of websites she can design when given any number of weeks.

Independent variable # of weeks =  $w$

Dependent variable websites designed  $d = d$

Equation  $3w = d$        $d = 3w$

$w$ Independent	$d$ Dependent
# of weeks	websites designed
1	3
2	6
3	9
4	12
5	15

Priya streams movies through a company that charges her a \$5 monthly fee plus \$1.50 per movie. Determine the independent and dependent variables, write an equation to model the situation, and create a table to show the total cost per month given that she might stream between 4 and 10 movies in a month.

Independent variable # of movies =  $m$

Dependent variable total cost =  $t$

Equation  $t = 1.5m + 5$   
or

$$t = 1.50m + 5$$

INDEPENDENT      DEPENDENT

# of movies	cost
4	11
5	12.50
6	14
7	15.50
8	17
9	18.50
10	20

## Exercises 1-4

Sarah is purchasing pencils to share. Each package has 12 pencils. The equation  $n = 12p$ , where  $n$  is the total number of pencils and  $p$  is the number of packages, can be used to determine the total number of pencils Sarah purchased. Determine which variable is dependent and which is independent. Then, make a table showing the number of pencils purchased for 3-7 packages.

2. Charlotte reads 4 books each week. Let  $b$  be the number of books she reads each week, and let  $w$  be the number of weeks that she reads. Determine which variable is dependent and which is independent. Then, write an equation to model the situation, and make a table that shows the number of books read in under 6 weeks.

3. A miniature golf course has a special group rate. You can pay \$20 plus \$3 per person when you have a group of 5 or more friends. Let  $f$  be the number of friends and  $c$  be the total cost. Determine which variable is independent and which is dependent, and write an equation that models the situation. Then, make a table to show the cost for 5 to 12 friends.

Do on  
a separate  
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paper  
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turn  
in.  
You  
have  
10 min  
for 5  
Problems.

4. Carlos is  
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\$2. Let  
number  
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